

with a power source for applying an electric potential between the metallized surface and the conducting surface disposed proximate the polishing pad.

71. (New) The apparatus of claim 70, wherein said plurality of contact elements is formed of at least one of conductively-enhanced polymer material, ceramic material and inorganic fibers.

72. (New) A method for removing metal from a metallized surface on a workpiece, the method comprising:

providing a polishing pad;

providing a conductive surface disposed proximate the polishing pad;

providing a plurality of contact elements disposed within said polishing pad;

pressing said workpiece against said polishing pad while causing relative motion between said workpiece and said polishing pad;

causing said metallized surface of said workpiece to contact said plurality of contact elements during said pressing; and

applying an electric potential difference between the plurality of contact elements and the conductive surface.

73. (New) The method of claim 72, further comprising supplying an electrolytic solution to a polishing surface of said polishing pad.

74. (New) The apparatus of claim 57, further comprising a driver motor operably connected to the polishing pad and the electrically conductive surface to produce orbital motion thereof.

REMARKS

By way of the present amendment, Applicant has corrected several minor errors in the specification and claims and has added new independent claims 67-74. After entry of the foregoing amendments, claims 1-74 (6 independent claims; 68 dependent claims) remain in the application.

No new matter is provided by these amendments. The Examiner is invited to telephone the undersigned if such would advance prosecution of this Application in any way.

Attached hereto is a marked-up version of the changes made to the specification and claims by this amendment. The attached page is captioned "Version With Markings to Show Changes Made"

Respectfully submitted,

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Version With Markings To Show Changes Made

In the Specification:

The paragraph beginning at page 8, line 24, has been amended as follows:

The electrolytic planarizing solution may also include a film forming agent which includes any compound or mixture of compounds that facilitates the formation of a passivation film of metal oxides and dissolution-inhibiting layers on the metallized surface of wafer 60. The passivation film reduces, and preferably eliminates, wet etching of the low topography areas of the metallized surface 80 of wafer 60 until the low topography areas come in contact with polishing pad 40. When these low topography areas come in contact with polishing pad 40 and electrical conductors 70, described below, the passivation film is removed and electrochemical etching may proceed. Thus, the passivation film enhances uniform planarization of wafer 60. Suitable film forming agents may be formed of nitrogen-containing cyclic compounds such as proline, adedine, mercaptonitriles, imidazole, triazole, quinaldic acid, benzotriazole, benzimidazole and benzothiazole and their derivatives with hydroxy, amino, imino, carboxy, mercapto, nitro and alkyl substituted groups, as well as urea, thiourea and others. Other suitable film forming agents may include benzofuroxan, benzothiadiazole, phenylenediamine, catechol, aminophenol [amionpheno], mercaptobenzothiazole [mercaptobenzthiazole], mercaptobenzotriazole [percaptobenztriazole], mercaptobenoxazole, melamine and thiadiazole.--

The paragraph beginning at page 18, line 14, has been amended as follows:

-- In another embodiment (not illustrated), the present invention may be configured for endpoint detection. Referring again to Fig. 6, as the metallized surface 80 of wafer 60 is removed during the planarization process, the resistance of the metallized surface 80 increases, thereby increasing the voltage through wafer 60. This change in the electrical potential [between] across the metallized surface [and the platen] may be monitored to determine the desired endpoint of the planarization process. Accordingly, the present invention provides the advantage of in-situ endpoint detection without requiring an additional dedicated endpoint detection system.--

In the Claims:

Claims 13, 22, 24, 39, 52 and 56 have been amended as follows:

13. (Amended) The apparatus of claim 1, wherein said platen is configured to move in [at least one of] an orbital [, circular and linear] pattern.

22. (Amended) The apparatus of claim 20, wherein said film forming agent comprises at least one of imidazole [imidzole], benzotriazole, benzimidazole, benzothiazole, adenine, proline, quinaldic acid, triazole, benzofuroxan, benzothiadiazole, phenylenediamine, catechol, aminophenol [amionpheno], mercaptobenzothiazole [mercaptobenzthiazole], mercaptobenzotriazole [mercaptobenztriazole], mercaptobenoxazole, melamine and thiadiazole.

24. (Amended) The apparatus of claim 1, [further comprising an endpoint detection apparatus] wherein the apparatus is configured to monitor a change in [said electric potential difference between] an electrical resistance across the metallized surface [and said platen and to detect an endpoint of planarization of the workpiece] on the workpiece upon the removal of the at least a portion of the metallized surface.

39. (Amended) The method of claim 36, further comprising moving said platen in [at least one of] an orbital [, circular or linear] pattern.

52. (Amended) The method of claim 36, further comprising monitoring a change in [said electric potential difference] an electrical resistance across the metallized surface on the workpiece [to detect an endpoint of planarization of the workpiece] as the at least a portion of the metallized surface is removed.

56. (Amended) The method of claim 36, wherein said supplying a first electrolytic solution comprises supplying an electrolytic solution having a film-forming agent comprised of at least one of imidazole [imidzole], benzotriazole, benzimidazole, benzothiazole, adenine, proline, quinaldic acid, triazole, benzofuroxan, benzothiadiazole, phenylenediamine, catechol, aminophenol [amionpheno], mercaptobenzothiazole [mercaptobenzthiazole], mercaptobenzotriazole [mercaptobenztriazole], mercaptobenoxazole, melamine and thiadiazole.

Claims 67-74 have been added to the application.